Provide a complete, detailed description of the proposed project, including the goals of the project, needed facilities and their location, and the area covered. Maps are generally not required (also see Attachment 5), but can be very helpful in explaining the proposed project. Describe how the project supports the goals and objectives of the GWMP. Applicant must clearly explain the relevance of project to the GWMP.

Describe the quality and usefulness of the information that will be obtained using technically feasible methods. Include a discussion of data, technical methods, and analyses to be used. The level of detail should be sufficient to determine the technical feasibility of the proposed project.

Describe how the applicant collaborates with other local public agencies with regard to the management of the affected groundwater basin. Discuss and provide evidence that a process is or will be in place that informs groundwater users, stakeholders, and the general public about the project to be funded with the proposed grant and disseminates relevant reports and data. A stakeholder is an individual, group, coalition, agency or others who are involved in, affected by, or have an interest in the implementation of a specific program or project. Explain and document how federal and other State agencies will be contacted. Examples include workshops, regularly scheduled groundwater association meetings, public notices, informational mailings, and websites.

Explain how ongoing use of the products derived from the proposed project will be funded after grant funds are expended. Additional State grant funds to continue with the funded project should not be a consideration. Provide examples of how often and under what funding mechanism monitoring wells will continue to be monitored, models maintained and used in the future, automated monitoring equipment maintained, or data management systems be updated and maintained. Include a discussion of measures that will be used to evaluate data and mechanisms to adapt the data collection process as new information is obtained. For proposals to develop a GWMP, explain how the GWMP will be implemented and how it will be funded.

Goals of the Project

The main goal of the project is to evaluate the feasibility of conjunctive use in the Stanislaus River watershed by:

- estimating upstream surface water availability from Calaveras County Water District (CCWD) both seasonally and under a range of hydrologic conditions given existing and future municipal/industrial and agricultural demands within CCWD,
- assessing groundwater recharge and storage opportunities within the existing Oakdale Irrigation District (OID) Sphere of Influence, which overlies portions of the Modesto and San Joaquin groundwater subbasins, and
- using the above information to evaluate the feasibility of conjunctively managing the surface water and groundwater resources to the benefit of the Stanislaus River watershed.

Figure 4-1 shows study area while Figure 4-2 shows the CCWD service area on the North Fork of the Upper Stanislaus River and Figure 4-3 shows the existing OID Sphere of Influence.

The potential benefits to CCWD and OID will include increased reliability of water supply within the watershed and adjacent groundwater basins as a whole and potential for further development of agricultural, municipal and industrial water uses and associated economic development in both the upper

and lower Stanislaus River watershed and adjacent groundwater basins while sustaining environmental and hydropower needs.

The evaluation identified above will be accomplished by completing the following tasks, described in greater detail in Attachment 5 – Work Plan.

Task 1 - Collect and Review Baseline Information
Task 2 - Stakeholder Outreach
Task 3 - Evaluate Water Supply Availability
Task 4 - High-Level Screening of Conjunctive Use Opportunities within OID
Task 5 - Focused Analysis of Specific Conjunctive Use Areas
Task 6 - Identification and Evaluation of Infrastructure for Conjunctive Use
Task 7 - Prepare Draft and Final Report
Task 8 - Project Management and Quality Assurance/Quality Control

Relevance of Project to IRGMP Goals and Objectives
The Stanislaus and Tuolumne Rivers Groundwater Basin Association (Association), of which OID is a member, was founded in 1994 and commissioned the preparation of the Integrated Regional Groundwater Management Plan (IRGMP). The Association is discussed in greater detail in the stakeholder outreach narrative. This conjunctive-use feasibility project is directly related to the purpose of the IRGMP which is to "provide a framework for coordinating groundwater and surface water management activities" for a planning area comprised of the entire Modesto Groundwater subbasin and a part of the Eastern San Joaquin Groundwater subbasin. The goal of the IRGMP is to:

> "provide for the integrated use of groundwater and surface water within the basin to ensure the reliability of a long-term water supply to meet current and future beneficial uses including agricultural, industrial, and municipal water requirements while protecting the environment."

In addition, the IRGMP has identified the following Basin Management Objectives (BMOs) for the planning area:

1. Maintain groundwater levels including consideration of conjunctive use
2. Control degradation of groundwater quality
3. Protect against potential inelastic land surface subsidence
4. Groundwater monitoring and assessment
5. Evaluate feasible water conservation measures
6. Coordination and cooperation

In addition BMOs, specific to the OID groundwater management subarea of the entire planning area include:

1. Develop system-wide wellfield optimization program
2. Manage groundwater and surface water resources conjunctively including
    a. Investigate feasibility of conjunctive use and groundwater recharge projects

b. Promote programs and action to protect recharge areas
c. Investigate feasibility of annexing areas on groundwater only to bring surface water for in-lieu recharge
d. Investigate upstream impacts on water quality and groundwater level within OID

Some studies have been prepared that have facilitated the Association and OID in achieving the goals of some of these BMOs. For example, a study was completed in 2007 by WRIME that evaluated the Recharge Characterization for the Association which will be a foundational document to this proposed study funded by DWR. A Well Field optimization program for MID and OID that included facilities inventory, well evaluations, database management system for groundwater data, and a decision support system for conjunctive use optimization in MID, where greater data density was available, was also completed in 2007 and funded by an LGA grant. This study will use the information collected in these earlier studies and build upon them to a higher level of specificity to study both source water from CCWD and groundwater storage in OID for conjunctive use.

While the CCWD portion of the Stanislaus River watershed has limited groundwater basins as defined by the Department of Water Resources (DWR) in Bulletin 118, CCWD has prepared a groundwater management plan (GWMP) and explored conjunctive use for the Camanche/Valley Springs area on the Calaveras River. In addition, CCWD has participated in conjunctive use studies of the Mokelumne River. Both the Calaveras and Mokelumne Rivers flow over a portion of the Eastern San Joaquin Groundwater subbasin. This study is brought on not only by CCWD's interest in conjunctive use as has been investigated in other parts of its service area but also because of the water that CCWD has available from the Stanislaus River that could contribute to a broader conjunctive use effort in the watershed. OID's location on the Stanislaus River as well as the simplicity of interaction with one agency has led to CCWD's decision to work with OID. Furthermore, OID's participation in the Association facilitates communication and cooperation within the greater Association membership.

Therefore, the Phase 1: Stanislaus River Reconnaissance-level Conjunctive Use Evaluation is directly relevant to the IRGMP for the Modesto and East San Joaquin groundwater subbasins and supported by the actions of CCWD in conjunctive use in their service area. Future phases of this study are anticipated to include more detailed evaluation of specific conjunctive use projects that will be identified through this initial phase.

Needed Facilities and Location of Facilities
No field work is included in this project therefore no facilities are needed to execute this project. This project will require cooperation of partners and stakeholders to provide technical studies and information to complete this conjunctive use evaluation.

Quality and Usefulness of Information Using Technically Feasible Methods
This project will provide CCWD and OID high-quality information that will be useful in determining whether the agencies should further invest in development of conjunctive use for the Stanislaus River watershed and adjacent groundwater basins. The data that will be used in this study to complete the tasks identified earlier include:

- Groundwater studies and well data such as well completion logs, long-term water-level measurements, water-quality sample results, and geologic information that will be derived from reputable sources such as U.S. Geologic Survey (USGS), DWR, as well as prior studies by OID, Modesto Irrigation District (MID), and other entities in the Modesto and Eastern San Joaquin groundwater subbasins, some of which were conducted under prior rounds of Local Groundwater Assistance (LGA) funding as discussed earlier.
- Surface water gauge and water-quality data from reputable sources such as USGS and local agency stakeholders.
- Other data such as precipitation, evaporation, and evapotranspiration from the California Irrigation Management Information System (CIMIS).

Technical methods to be used in this study include the use of the results of existing models for both surface water and groundwater hydrology. For surface water hydrology to complete Task 3 - Evaluate Water Supply Availability, output from an OASIS with OCL ™ proprietary water management model prepared for CCWD will be used to provide summaries of surface water availability at New Melones Reservoir on a monthly basis. These monthly summaries will account for hydrology from 1922 to the present which includes several critical dry year periods including 1928 – 1934, 1976-1977, and 1987-1991 under current operational rules for CCWD's New Spicer Reservoir and Hydropower facility. The OASIS model uses inputs including daily unimpaired inflow data derived from gage data and reservoir storage data, consumptive demands, permits, licenses and agreements, and general operating rules used to simulate power dispatch. Model calibration is performed by comparing model results to recent historic operations. Minimum flow requirements, consumptive deliveries, reservoir storage, and generation patterns are reviewed for consistency. Adjustments are made to the operating rules until the model reasonably represents the decisions made by the operators. The output from OASIS will be aggregated into monthly summaries that will account for both seasonal and dry year hydrology and be an input to the groundwater analysis described below.

For the groundwater conjunctive use area screening in Task 4 - High-Level Screening of Conjunctive Use Opportunities within OID, the existing groundwater studies including the IRGMP, the WRIME recharge study, the Wellfield Optimization Project completed for the OID service area, USGS studies as well as well logs and other source data will be reviewed to identify potential areas within the OID Sphere of Influence that may have good characteristics for a range of conjunctive use options including direct surface recharge and in-lieu conjunctive use. Task 4 will result in identification of a subset of sites for more detailed study in Task 5 – Focused Analysis of Specific Conjunctive Use Areas.

Task 5 will utilize either the existing USGS regional groundwater MODFLOW model for the San Joaquin Valley Regional Study Area or, if an area for detailed study is not within the MODFLOW domain, a spreadsheet water-balance model will be developed using soils and groundwater data reviewed in Task 4. The MODFLOW model focused on the Modesto area, extended as far east as Modesto Reservoir and has been calibrated for steady-state conditions. The MODFLOW model is undergoing calibration for transient conditions, which will be completed by the end of 2012. Both calibration and technical review of USGS products are to the highest technical standards. The MODFLOW model parameters may also be used, as appropriate and based on the expertise of the

hydrogeologist, in developing inputs to the spreadsheet model, which will use Darcy's Law to estimate groundwater elevations and flow rates.

Collaboration with Other Local Public Agencies in Management of the Groundwater Basin
The water agencies that manage the Modesto and Eastern San Joaquin groundwater subbasins have had a high degree of collaboration in basin management since the formation of the Stanislaus and Tuolumne Rivers Groundwater Basin Association (Association) in 1994. The six agencies of the Association are the City of Modesto, MID, City of Oakdale, OID, City of Riverbank and Stanislaus County. The IRGMP was commissioned by the Association so that the six member agencies could coordinate planning and management of the groundwater underlying the agencies' service areas. The Association meets regularly, usually monthly to share information, discuss ongoing activities and coordinate the groundwater management activities of the agencies.

These meetings are an important communication mechanism and will be one of the primary means by which outreach and collaboration will occur within the groundwater basin. At a recent meeting it was noted that a separate LGA application is being prepared by the City of Modesto for study of deep aquifers in the western portion of the planning area in anticipation of aquifer storage and recovery. The City of Modesto LGA is a complementary activity to this proposed study as it will increase the knowledge of recharge in a different portion of the planning area. The regular meetings of the Association will be one of the means that groundwater users, in particular, will be informed of this study.

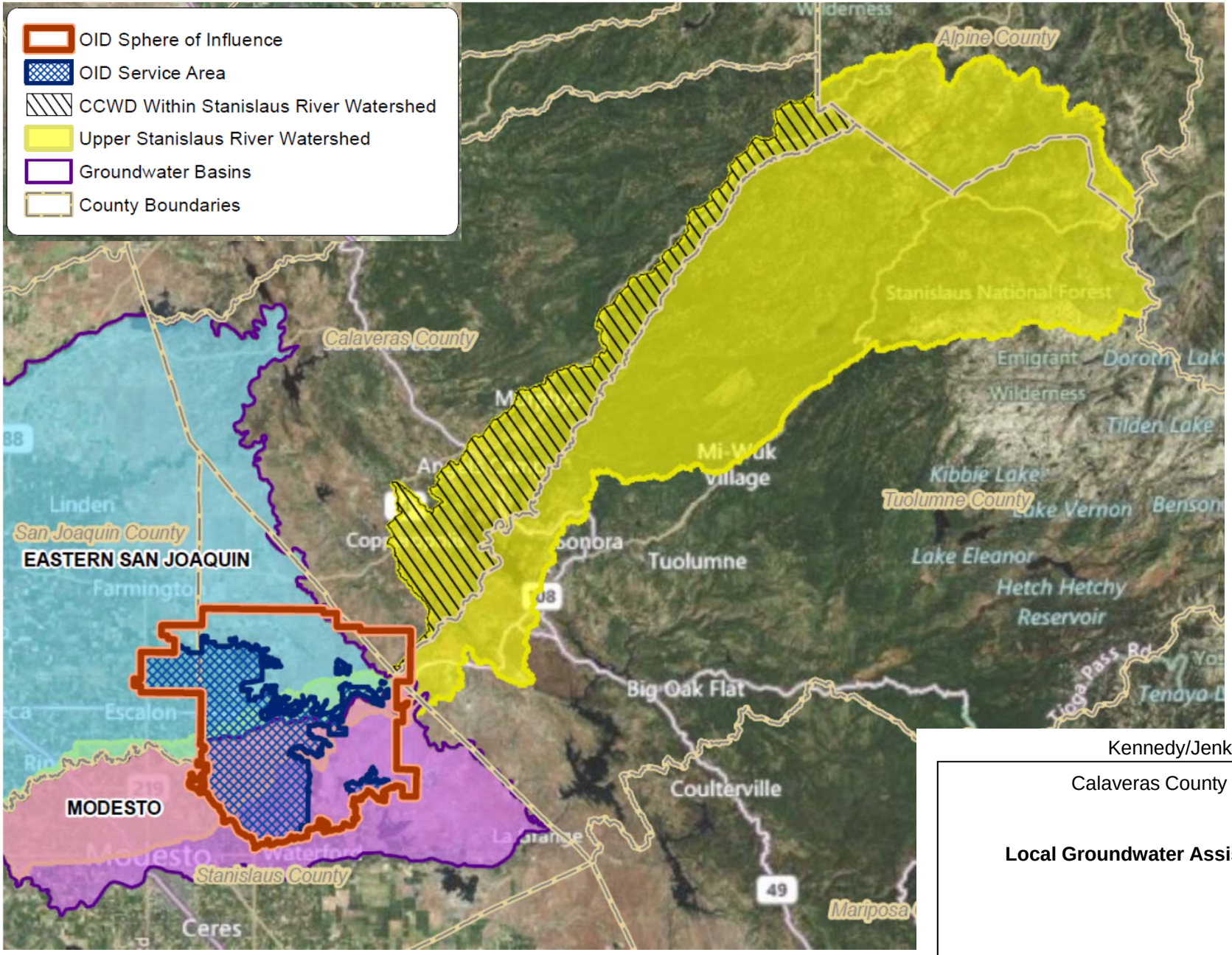
State agencies such as DWR Central District and Headquarters will be contacted as a source of technical information; in addition, relationships with federal agencies such as USGS already exist that have resulted in acquisition of studies as well as the MODFLOW input files and valuable consultation with USGS staff by the consultant team. These relationships will be furthered in order to gather additional technical information regarding the groundwater basin.

Furthermore, this proposal is a first effort to collaborate between upstream and downstream agencies in the Stanislaus River watershed. This partnership between the upstream Stanislaus River water agency, CCWD, which has available water but limited groundwater basins for conjunctive use and a downstream Stanislaus River water agency, OID which overlies 72,500 acres of the Modesto and Eastern San Joaquin groundwater subbasins, presents a potentially significant opportunity for conjunctively managing the resources of the Stanislaus River. The potential benefit of this project is to enhance agricultural, municipal and industrial, environmental and hydropower uses of water across the entire Stanislaus River watershed.

Task 2 – Public Outreach in Attachment 5 – Work Plan describes public outreach in more detail. It is anticipated that stakeholder outreach to the upper watershed community will also be an important element of this study. This will be accomplished by a combination of CCWD staff with relationships in the service area as supported by a consultant technical team.

Ongoing Use of Products After Grant Funds are Expended

As described earlier, it is expected that the results of this study will be critical in evaluating the investments that CCWD and/or OID will make as it relates to conjunctively managing the resources of the Stanislaus River and Modesto groundwater subbasin. The study will provide valuable focus and information whether the agencies will seek to fund further work through agency resources or other outside funding sources. As there are no physical assets being funded through this grant, no additional operations and maintenance funds will be required in the future.



Kennedy/Jenks Consultants

Calaveras County Water District

Local Groundwater Assistance Grant
Study Area

July 2012

Figure No. 4-1

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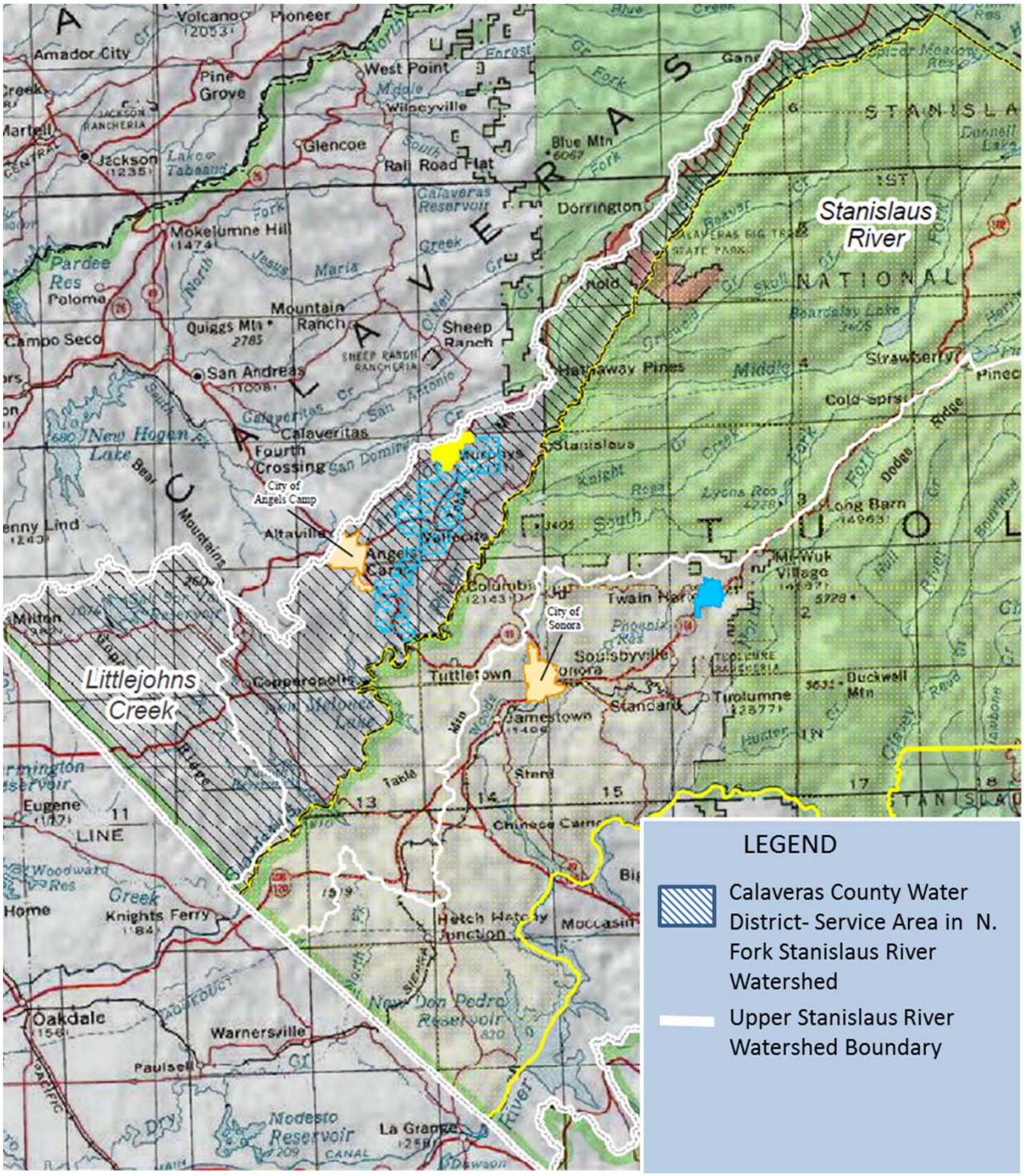

Kennedy/Jenks Consultants

Reference: Tuolumne-Stanislaus IRWM

Calaveras County Water District

Local Groundwater Assistance Grant
CCWD Service Area

July 2012

Figure No. 4-2

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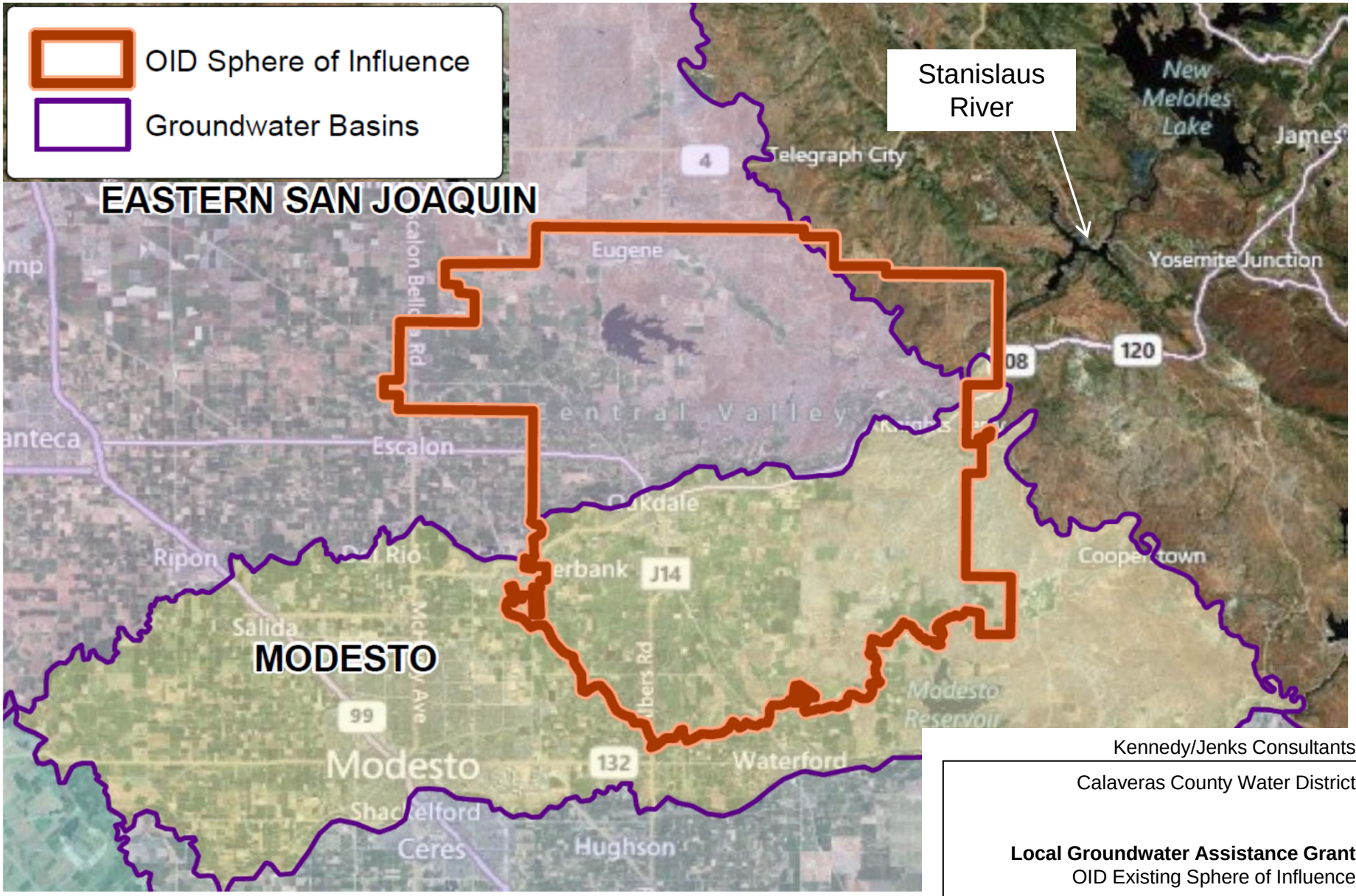

Kennedy/Jenks Consultants

Calaveras County Water District

Local Groundwater Assistance Grant
OID Existing Sphere of Influence

July 2012

Figure No. 4-3

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